used in transacting the world's business could be made to reappear, if not with scientific, at least with commercial accuracy, on the other side of an abyss of time and space before which the human mind shrinks back in dismay. The science of the eighteenth century sought to render itself immortal by basing its standard units upon the solid earth; but the science of the nineteenth century soars far beyond the solar system, and connects its units with the ultimate atoms which constitute the universe itself.

## *SCIENTIFIC SERIALS.*

THE *American Meteorological Journal* for July contains an article by Prof. H. A. Hazen on storms and a central ascending current. The author discusses a few of the arguments for and against the theories of storm formation, viz. the theory of an ascensional current in the centre of a storm, and that of the increase of energy, through the liberation of latent heat and consequent production of a partial vacuum. Some of the conclusions arrived at are that the theories are exceedingly unsubstantial, and that, above all things, positive information of the processes going on in upper air strata is necessary; that the dependence of the generation of storms on temperature distribution in a vertical direction appears open to doubt; and that, reasoning from the behaviour of thunderstorms, it seems possible that some electrical action, not thoroughly understood, supplies the force which keeps up their energy.—Mr. A. L. Rotch contributes an article on the organization of the Meteorological Service in Holland. The Institute at Utrecht existed as a private establishment as early as 1849, and its Director, Dr. Buys Ballot, first stated publicly in 1857 the relation between wind and atmospheric pressure in the law which bears his name. Dr. Buys Ballot has for many years endeavoured to combine trustworthy observations all over the world with each other, and has published, in his "Year-book," detailed observations for various distant parts. Branch offices are established at Amsterdam and Rotterdam, and the collection of observations made at sea is actively carried on. At present the work bears upon the South Atlantic in connection with the Deutsche Seewarte, and, independently, upon the Indian Ocean.—Prof. C. F. Marvin continues the discussion between himself and Prof. Hazen as to the cause of differences obtained in anemometer experiments. Prof. Hazen attributes them to the influence of the natural wind blowing at the time, while Prof. Marvin thinks this of little importance and calculates its effect by a formula. He thinks that the momentum theory of the cups explains the discrepancies in a satisfactory manner.—Lieut. J. P. Finley contributes tornado statistics for the State of Iowa for fifty-two years ending 1888.

## *SOCIETIES AND ACADEMIES.*

### LONDON.

**Entomological Society**, August 7.—The Right Hon. Lord Walsingham, F.R.S., President, in the chair.—Prof. C. V. Riley, of Washington, was elected an Honorary Fellow in place of the late Dr. Signoret, of Paris.—Mr. Walter F. Blandford exhibited a specimen of *Cardiophorus cinereus*, taken at Tenby, and remarked that the species had rarely, if ever previously, been found in the United Kingdom. Mr. C. O. Waterhouse said he believed that there was a specimen in the collection of his late father, and also another specimen in the collection of the British Museum.—Mr. Waterhouse stated that the British Museum had just received from the Rev. A. Elwin, of Hang-chow, China, a luminous larva about $1\frac{1}{2}$ inch long, and $3\frac{1}{2}$ lines broad, which he believed to be one of the *Lampyridæ*.—Lord Walsingham exhibited specimens of *Conchylis degreyana*, McLach., bred from seed-heads of *Plantago lanceolata* at Merton, Norfolk; also a specimen of *Tineidæ* allied to the genus *Solenobia*, probably belonging to *Dissoctena*, Staud., but differing somewhat in the structure of the antennæ. He said that the specimen was taken by himself at Merton on July 31 last, and that the species was apparently undescribed.—Herr Meyer Darcis exhibited a collection of Coleoptera, comprising specimens of a species of *Loethrus* from Turkestan; *Julodis globithorax*, Stev., from the Caucasus; a new species of *Julodis* from Kurdistan; *Cardiaspis Mouhotii*, Saunders, from Sikkim; *Carabus smaragdinus*, Fisch., from Siberia; *Julodis ampliata*, Mars., from Aintab, Asia Minor; and *Julodis luteogramma*, Mars., from Syria, and a variety of the same from Kurdistan.—Mr. H. Goss read extracts from letters from Mr. R. W. Fereday, of New Zealand, and Sir John Hall, K.C.M.G., relating to a number of Lepidoptera recently collected at sea, about half-way between the River Plate and Rio, at a distance of over 250 miles from land, in about 30° S. lat. and 46° W. longitude. It was stated that the ship was surrounded by swarms of moths. Mr. J. J. Walker, R.N., observed that he had seen large numbers of insects at sea about 150 miles off the coast of Brazil, and he referred to other records of the capture of insects at sea in Darwin's "Voyage of the *Beagle*," and Dr. Carpenter's "Cruise of the *Alert*." The discussion was continued by Dr. Sharp, Lord Walsingham, Mr. White, and Mr. Kirby.—Mr. E. Meyrick read a paper entitled "On some Lepidoptera from New Guinea," and exhibited the species described in the paper. He stated that the specimens were derived from two sources, viz. (1) a portion of the collection received by the Society from Baron Ferdinand von Müller, F.R.S., and collected by Mr. Sayer when accompanying the Australian Geographical Society's Exploring Expedition; and (2) a number of specimens collected by Mr. Kowald near Port Moresby.—Mr. Blandford read a letter from Mr. Wroughton, of Poona, asking for assistance in working out certain Indian Hymenoptera and Diptera in the collections of the Bombay Natural History Society. Lord Walsingham, Colonel Swinhoe, and Mr. Moore made some remarks on the subject.

### PARIS.

**Academy of Sciences**, July 29.—M. Des Cloizeaux, President, in the chair.—On a means of studying the natural history of the river-eel after its migration from fresh to salt water, by M. Émile Blanchard. It was shown by the author many years ago that, during its sojourn in fresh-water lakes and rivers, the eel remains in an immature state, incapable of reproduction. With a view to completing its life-history, he now suggests that large numbers should be taken on their way seawards, labelled with a little metallic plate, and then returned to the water, in the hope that a few so marked may afterwards be captured at intervals in the sea, and thus enable zoologists to follow their complete evolution. To give effect to this project, he seeks the co-operation both of Government and naturalists.—On the variations of latitude in the solar spots, by M. R. Wolf. Attention is directed to pp. 84–91 of No. 73 of the *Astronomische Mittheilungen*, where the author infers, from his studies of solar physics, that the abrupt change of latitude noticed at the epoch of the minimum does not depend exclusively on the period of $11\frac{1}{9}$ years, but also on the longer period of $66\frac{2}{3}$ to $88\frac{1}{3}$ years. This longer period determines the altitude of the maxima, so that the extent of the change in latitude and the altitude of the ensuing maximum increase or diminish simultaneously. Hence the change of latitude recorded by Spoerer for the second half of the seventeenth century would not appear to have been anomalous, but merely the result of the low maxima reached at that time. — On the transmission of power by alternate currents, by M. Maurice Leblanc. But for the difficulties caused by the phenomena of self-induction, alternate currents might be advantageously employed for transmitting power, as they may easily receive the highest tensions, while they do not alter the insulators, as is the case with continuous currents. The author here describes an apparatus by means of which he hopes that these difficulties may be obviated.—On the conductibility of electrolytes at very high temperatures, by M. Lucien Poincaré. The methods employed by MM. Bouty and Poincaré in their experiments on the electric conductivity of salts in solution cannot be directly applied beyond the melting-point of glass. But, by various dispositions here detailed, M. Poincaré has been enabled to obtain measurements to within about one-fiftieth of absolute accuracy.—On a new method of volumetric analysis for silver, mercury, and thallium, by M. Adolphe Carnot. Chemists possess excellent processes for the volumetric analysis of silver, but very defective ones for that of mercury. M. Carnot here describes a new method, based on the use of potassium iodide, which is about equally applicable to both of these metals, as well as to thallium.—Researches on the sulphites, by M. P. J. Hartog. Despite the difficulty of its preparation, the author has succeeded in obtaining an anhydrous and crystallized sulphite of potassa in large quantities. By the same process, which is described in detail, he has also prepared the sulphite of soda in the same form, but not in a pure state, and the double normal sulphite of potassium and soda. The preparation of other sulphites will be described in a future communication.—Synthesis of some selenium compounds in the aromatic series, by M. C. Chabrié. The syntheses here undertaken are those in which the metalloid is united directly with the car-

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bon of the cyclic nucleus. By making selenium tetrachloride act on benzine, M. Chabrié has obtained compounds corresponding to the sulphides and thiophenols prepared by Friedel and Crafts from sulphur and the chloride of sulphur.—On the oxidizing action of nitroso-camphor under the influence of light, by M. P. Cazeneuve. This substance, recently obtained by the author (*Comptes rendus*, cviii. p. 857), yields Liebermann's blue reaction with phenol and sulphuric acid, and also presents the curious phenomenon of becoming decomposed under the influence of light. The conditions seem somewhat analogous to those attending the formation of chlorophyll and of the colouring-matter in flowers.—On the isocamphols, by M. A. Haller. The paper deals more particularly with the influence of solvents on the rotatory power of the isocamphols.—Respiratory combustion by the nervous system in its relation to the size of the animal, by M. Charles Richet. A large number of experiments on dogs confirm, for animals of the same species, the law established by Regnault and Reiset for animals of different species—namely, that the respiratory combustions, by kilogramme of living weight, increase in inverse ratio to the size of the animal.—On the products of microbes favourable to the development of infections, by M. G. H. Roger. Amongst the substances secreted by Bacteria, some are known to produce intoxicating phenomena, while others possess vaccinating properties. M. Roger's researches lead to the inference that there are others that tend to stimulate the development of certain pathogenic agencies, at least in the case of symptomatic charbon.—On a new Mediterranean species of the genus Phoronis, by M. Louis Roule. This specimen was found in the Zoological Station at Cette, and has been named *Ph. sabatieri*, from the founder of that station. The characteristics of the species are here described by contrast with *Ph. hippocrepis*, Str. W.—On the growth of the oceanic sardine, by M. Georges Pouchet. Observers have failed to determine the region where the sardine is hatched and passes the first phases of its development. Those reaching the fishing-grounds are already several months old, and the observations made at several points present so many discrepancies that no general law can be laid down regarding their growth during the fishing season. The difficulty of determining this point is increased by the fact that the shoals themselves appear to be continually renewed by fresh arrivals throughout the whole season.

August 5.—M. Des Cloizeaux, President, in the chair.—Heat of combination of fluor with hydrogen, by MM. Berthelot and Moissan. After many failures, the authors have at last succeeded in measuring the heat of combination of these bodies. Reserving for a future communication the details of their experiments, they here give the broad results expressed in the formulas :—

$H + F$ gas = $HF$ gas ... ... ... + 37·6 calories
$H + F$ = $HF$ dissolved ... ... ... + 49·4 ,,

—On the relations of atmospheric nitrogen with vegetable soil, by M. Th. Schlœsing. Continuing his researches on this subject with fresh samples of earth taken from various districts and under varying conditions, the author has still failed to discover any soil which being destitute of vegetable germs fixes gaseous nitrogen. Hence he concludes that if any exist they must be regarded as quite exceptional, and not to be depended on by agriculturists.—Observations of Davidson's comet (July 23) made at the Observatory of Algiers, by MM. Trépied, Sy and Renaux. The observations cover the period from July 26 to July 30, when the nucleus of the comet was comparable to a star of the eighth magnitude.—A study of the electric phenomena produced by solar radiations, by M. Albert Nodon. Numerous observations made at the laboratories of the Sorbonne and the Collège de France show that on meeting an insulated metallic or carbon conductor the solar rays communicate to it a positive electric charge; that the amplitude of this charge increases with the intensity of the rays, and decreases with the hygrometric state of the air, the phenomenon attaining its maximum value in Paris about 1 p.m. in summer, when the atmosphere is pure and dry; lastly, that the effects cease during the transit of clouds across the face of the sun. If these results can be extended to non-metallic bodies, then solar radiation may be regarded as one of the causes of the electrization of the clouds.—Researches on the sulphites (continued), by M. P. J. Hartog. Here are studied the double normal sulphites of potassium and ammonium, and the bisulphite sulphite of sodium and potassium.—On the heat of combustion of some organic compounds, by M. J. Ossipoff. The bisubstituted succinic acids, presenting certain analogies with the fumaric and malic acids, are here studied thermochemically with a view to determining their heat of combustion.—A chemical and thermic study of the phenolsulphuric acids (continued), by M. S. Allain Le Canu. In the present paper the author confines his researches to orthophenolsulphuric acid, the preparation and properties of which are fully described.—On the distribution of Nemertes on some points of the French seaboard, by M. L. Joubin. A systematic exploration of the Roscoff and Banyuls districts has resulted in the discovery of nearly sixty species of Nemertes in those two localities alone. About ten of these have not yet been described, and will form the subject of a future memoir.—On the mechanism of the photodermatic and photogenic functions in the siphon of *Pholas dactylus*, by M. Raphael Dubois. Although these mollusks possess no eyes, they display extreme sensibility to light, the least change of its intensity sufficing to excite a more or less sudden contraction of the siphon. M. Dubois's already described graphic process has enabled him to verify the existence of two distinct functions, one receptive, the other emissive, thus showing that the mechanism of sight belongs to the category of tactile phenomena in the higher animals gradually differentiated and localized in a special organ. It also appears that the photodermatic (receptive) function is stimulated by luminous vibrations from without, while the photogenic (emissive) has for its final outcome the emission of luminous rays through the circumambient medium.—On some habits of the sea trout, by M. A. Giard. The author's observations in the Wimereux estuary and neighbouring waters, tend to show that many smelts and grilses, and even a number of adults (bull-trout?), pass a much longer time in the sea than is generally supposed by ichthyologists.—On the colouring matter of the spermoderm in the Angiosperms, by M. Louis Claudel. The results are here given of a series of studies on the pigments of grains made in the botanical laboratory, Marseilles. It appears generally that the solid pigments of grains are scarcely ever presented under the form of leucite, and that they derive directly from the protoplasm. In this respect they differ from the pigments of flowers and pericarps which, according to Flahault and others, derive from pre-existing leucites.—On the recent eruption of the island of Vulcano (Lipari Group), by M. O. Silvestri. The volcanic phenomena presented by the eruption, which began on August 2, 1888, are characteristic of a special phase, which has already been observed by M. Silvestri at Etna, and to which he proposes to give the name of *Vulcanian phase*.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Practical Photometry: W. J. Dibdin (King).—Picture-Making by Photography, 2nd edition: H. P. Robinson (Hazell).—Shut out from Love: J. Nickal (Hughes).—Éléments d'Économie Politique Pure, deuxième édition: L. Walras (Lausanne, Rouge).—Lehrbuch der Vergleichenden Anatomie, Zweite Abtheilung: Dr. A. Lang (Jena, Fischer).—Cours de Minéralogie, deuxième édition: A. de Lapparent (Paris, Savy).—Chemical and Physical Studies in the Metamorphism of Rocks; A. Irving (Longmans).

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